



Shallow water table response to seasonal and interannual climate variability

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Year: 2011
Journal: Transactions of The Asabe. 54 (6): 2079-2086

Abstract:

Headwater seepage wetlands occur near the base of slopes and bluffs, typically at the outer edge of a floodplain or stream corridor, and may serve important roles in local and regional biodiversity, water quality, and biogeochemical cycling. The features are surface expressions of the water table aquifer that flows from adjacent upslope land. The water table is the primary source of streamflow, especially baseflow, in many Coastal Plain streams, so changes in precipitation patterns and land use may impact local habitat and downstream water supply. This article reports on some of the trends and dynamics of the water table in headwater seepage areas on the South Carolina Coastal Plain at seasonal and interannual time scales. The two study sites are in the Four Hole Swamp and Halfway Swamp Creek watersheds. Shallow monitoring wells were installed in mid-2005 in four seepages along with continuous water level loggers. There was significant interannual variability in water table depth during the 5.5-year study interval. The pattern was similar between wells at the same site but not between sites, suggesting that local geomorphology and soils influence the groundwater travel time of precipitation to the seepage discharge. Diurnal water table dynamics also show similarity between wells at the same site but not between sites. At Four Hole Swamp there were significant seasonal differences but not at the Halfway Swamp Creek site. Site morphology, soils, and vegetation are hypothesized as key factors in these observations. These results suggest that the water table aquifer is a resource that requires explicit protection in the context of increased human development and uncertain trends in future precipitation.

Source: <http://dx.doi.org/10.13031/2013.40663>

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Food/Water Quality, Food/Water Security

Geographic Feature:

resource focuses on specific type of geography

Freshwater

Geographic Location:

resource focuses on specific location

Climate Change and Human Health Literature Portal

United States

Health Impact:

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation

Resource Type:

format or standard characteristic of resource

Research Article

Resilience:

capacity of an individual, community, or institution to dynamically and effectively respond or adapt to shifting climate impact circumstances while continuing to function

A focus of content

Timescale:

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment:

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content